

McMillin Minerals along Line of Ironton & North Eastern R.R.

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REPORT OF E. McMILLIN,

SHOWING QUANTITY AND KIND OF MINERALS  
ALONG THE LINE OF THE PROPOSED

*Ironton & North Eastern R. R.*

FROM—

*Ironton, Lawrence County, to Gallipolis,  
Gallia County, Ohio.*

*Together with Data Referring to Resources and Prospective  
Business of the Ironton & North Eastern  
Railroad Company.*

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IRONTON, OHIO:  
PRINTED AT THE REGISTER OFFICE,  
1881.





*REPORT OF MINERAL RESOURCES ALONG THE  
LINE OF PROPOSED RAILROAD FROM IRON-  
TON TO GALLIPOLIS.*

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JOHN CAMPBELL, ESQ.,

Dear Sir:

I herewith submit to you a report of the work done, under your direction, in the investigation of the quantity, and quality of the minerals along the proposed line of Railroad from Ironton to Gallipolis.

The general direction of this Road is, from the South West, to the North East, passing through the Townships of Upper, Lawrence, Elizabeth, Aid and Symmes, of Lawrence County, and Townships of Walnut, Perry, Green and Gallipolis of Gallia County. It passes near Hecla, Vesuvius and Oak Ridge Fces., and the towns of Arabia, Waterloo and Patriot.

**TOPOGRAPHY.**

The line of road is located in Lawrence County along the valleys and ravines made by the waters of Ice Creek, Storms Creek, Elkins Creek and Symmes Creek; and the bluff hills upon either side of the road rise from 200 to 400 feet high, making the minerals quite easy of access, and mines easily drained.

Any of the Streams named, afford an ample quantity of water for the demands of a mining region.

**MINERALS.**

The minerals found along line of proposed road, between this City



(Iron-ton) and Waterloo, this County, (distant 23 miles) are Iron Ores, Bituminous Coals, Limestone, Fire Clay and Potter's Clay.

### LIMESTONES.

The lowest Limestone exposed or mined along the route described, is the "Ferriferous" of the earlier geological reports, or the "Hanging Rock" Limestone of Professor Orton's later reports. This Limestone is found in a nearly horizontal vein (as are all the other minerals of this locality), about five feet thick. It is above the proposed road bed all along the line, with the exception of about two miles where road crosses the divide between the waters of Ice and Storms Creek, until it reaches nearly to the divide of waters between Storms and Elkins Creek, or for 12 miles, upon either side of road.

This limestone is almost exclusively used in the Hanging Rock Iron District as a flux in the manufacture of metal.

The next three limestones of the section are the "Snowfork" "Norris" and "Shawnee," names given in state geological report. The veins range from 9 inches, to 24 inches, in thickness. Upon exposure these limes ~~are~~ all <sup>+ weather</sup> rather a beautiful buff color, and are locally known as "buff" Limestones. In this locality they have but little commercial value. These limes are about forty feet apart, and are 100, 140 and 180 feet respectively above Hanging Rock Limestone.

### CAMBRIDGE LIMESTONES.

The Cambridge Limestone lies in two seams separated by shales from 15 to 30 feet. It lies well up in the hills along the road for a distance of 35 miles. The upper seam is 2 to 4 feet thick, generally a comparatively pure limestone. The lower seam from the Ohio River to near Arabia is often very silicious, and in places substituted by a calcareous shale. North and East of Arabia it is a flinty seam and is easily quarried, breaking into rectangular blocks 12" to 15" square and 3' to 5' long. It is a valuable material for the construction of foundations.

### AMES LIMESTONE.

This limestone lies about 130 feet above the Cambridge, and is found in abundance along the line from the headwaters of Storms Creek to Gallipolis, about 30 miles.

This is a highly fossiliferous Lime, and generally, comparatively free from silicious matter. Seam from 2' to 4' thick.

### ACCESSORY LIMESTONES.

There are three veins of Limestone lying between the Cambridge and the Ames.

The position of these limes are usually indicated only by "red bands" of clay. Though over portions of the territory they show exposures of 1'



to 3' in thickness. The middle one of these three seams, or the Ewing of the geological survey, develops a good ledge in the hills about Oak Ridge.

### ORES OF IRON.

By far the most important of the Ore seams in the field examined, is the vein known as the "Limestone Ore." This seam lies upon the Hanging Rock limestone, and ranges from 4 inches to 3 feet thick, usually 8" to 14" thick. It exists in three forms: Limonite (red ore), semi-carbonate (gray ore), carbonate (blue ore). These all become sesquioxides when calcined, as they are before being used in the blast furnaces.

These are the ores from which the celebrated Hanging Rock Carwheel, Foundry and Forge Metals are almost exclusively made. The position of this seam is above the proposed road bed, from the Ohio River to near the head of Storms Creek, (excepting about two miles) for a distance of fourteen miles. This vein of ore is overlaid with 3 to 5 feet of Fire and Potters clay, which in turn is usually overlaid with sandstone, making the seam one to be easily and safely mined.

### BLACK KIDNEY.

About fifty feet above the Hanging Rock Lime is found the horizon of the "Black Kidney" of some portions of the District. In other places it is variously known as "top hill," "red kidney," etc. This is a carbonate of Iron, often containing large per cent. of phosphorus, but in some localities regarded as a valuable ore of iron. This ore is found below the Sheridan or Number 6 coal of the survey.

Twenty to thirty feet above No. 6 coal, and four to ten feet below the little buff or snowfork limestone are found two seams of ore, separated by slate 4 to 8 feet. These seams are almost identical in appearance, and composition. They are each 3" to 10" thick; and are comparatively pure carbonates of iron, usually though, in dry localities, and when loosely imbedded in the slate they become a "yellow kidney" or limonite. These seams like the preceding seam are known by various local names, viz.: "Black Kidney," "Yellow Kidney" and "Top Hill" ore. This ore may be found above the line of road almost the entire distance from Ironton to Waterloo.

This is regarded as a good ore by furnacemen of the Hanging Rock district, particularly when found as a limonite.

There are seams of ore above the horizons just described as follows: 15 feet above, buff lime intervening, 13 feet higher, with 6a coal intervening, 23 feet higher, with Norris Buff Lime intervening. Again 15 feet up, with 6b coal intervening, 26 feet higher with Shawnee Lime intervening, 18 feet higher with number 7 coal intervening. 14 feet above this last ore comes in 7a or Cambridge Coal. The last ore indicated is believed to be the equivalent of the Iron Point Ore of the Hocking District, and will doubtless be developed in large quantities in the hills along the line of the proposed road. But none of the ores named that lie above the lower Buff Limestone have been investigated to any great extent by the furnacemen of this district, doubtless because of the inexhaustible quantity of limestone ore of known and approved quality, to be found on the furnacelands. These

upper Ore seams all show out of the hills, and old abandoned and washed roads, as brown hematites or limonites; but it is probable that further under cover they would often be carbonates. They are found in the hills upon either side of the road for a distance of 25 miles of its length.

The sandstones however often thicken so as to cut out some of these seams.

### RED HEMATITE ORE.

This ore is found in small pieces in all the ravines and valleys and on hillsides from a point 30 to 50 feet above the Cambridge lime. Its horizon is probably near that of the Ewing Limestone. It is very pure, and would at this time find a ready market in this City at \$10 to \$12 per ton. It extends along the line of road from near Hecla Furnace to beyond Raccoon Creek in Gallia County, distant 35 miles. Whether a seam of this ore can be found thick enough to justify mining is a problem that will only be solved by the use of pick and shovel.

### COAL.

Doubtless the most important of all the minerals along the Rail Road route is coal.

Seams of coal are found opened and locally mined, along the line as follows: Conway or No. 3a, No. 5, No. 6, 6a, 6b, 7a, 7b, and the "Slate Vein;" and to the right of the line a vein in the upper coal measures.

The lower of the series is the

**Conway, or No. 3a.** This seam is above, or on level of the road for a distance of about five miles of its length. It is 12" to 36" thick, of fair quality, overlaid with slate and sandstone. While it is mined occasionally for domestic use, it is not regarded as having much if any commercial value.

**Number 4 Coal,** the next in the series of the geological survey, seems to be nowhere developed along the road; and is generally regarded as being absent, though North and West of this line in nearly all the Hanging Rock District, it is a persistent seam, lying immediately under the Hanging Rock Limestone. Where found it is 4 to 5 feet thick. It has been seen at but one place along the line—near head of Storms Creek, and there but about 6 inches thick.

**Number 5 Coal.** This seam overlies the Hanging Rock Limestone from 10 to 30 feet, often with a sand rock intervening, but frequently only slate, fire clay and potters clay intervene.

This seam is locally known as the New Castle or Tunnel Coal. It has been more extensively mined than that of any other seam in the district. It is usually found 42" to 48" thick, though it sometimes thins down to 30" and again thickens to 60".

It has been used exclusively for the past 30 years in the Rolling Mills of this City, and has been extensively mined at New Castle for Steamboat use, and for shipments to ports down the river. It is a favorite coal with



locomotive firemen and engineers. It is a quick burning, but not very pure coal. It is not regarded as a coal that could be used in blast furnaces for smelting Iron.

This seam lies above the grade and upon either side of the road from this City to head of Storms Creek (excepting perhaps two miles) distant say 12 or 13 miles.

**Number 6 Coal.** This seam is locally known as the Sheridan Coal, and is classed in the geological report of Prof. Orton as the equivalent of the Nelsonville Coal. The seam has been extensively mined in this County by the Sheridan Coal Works. The coal is of superior quality, and the seam is worked in the Hocking Valley blast furnaces, and in the Washington Furnace, this County, and in the Ashland Furnace, Ky, for smelting iron with good results. The vein is usually about 42" thick, but sometimes thins to two feet and often runs up to 4 feet. The horizon lies 30 to 60 feet above coal No. 5, usually about 35 feet along the line of road. It is above the line of road from this City or vicinity to the head of Storms Creek, or about 13 miles.

**Coal Number 6a.** This is the number given to it by the Ohio Survey. It is locally known as the "Hatcher" coal. It lies 35 to 55 feet above the Sheridan. It has been opened and mined for domestic use in a great many places. It is a solid good coal and ranges in thickness from 30" to 6 feet. It will be found above the road bed all the way from the Ohio River to Waterloo, say 25 miles. About Oak Ridge Furnace it is mined where it shows 6 feet of coal. But perhaps, 5 feet or 5' 6" would cover the good coal at these openings. At Waterloo it is reported to have been opened and the opening again filled up. There are no natural exposures about Waterloo at this horizon where coal is more than 9" thick.

**Number 6b** of the Ohio Survey is found along the route of the proposed road from 20 to 30 feet above 6a. This seam has been little sought after in the vicinity of this City, and when found and opened it has heretofore been considered the Hatcher coal. It has been mined on Sailer's farm on Ice Creek. This is the only opening found Southwest of the divide between the waters of Storms and Elkins Creeks. But the blossom, or mark, can always be found in roadways and breaks in the hills. It lies but a few feet under the middle conglomerate sandstone. At Oak Ridge Furnace it is mined where it shows 5 to 7 feet of most excellent coal. Again, at Waterloo, there are a great many openings of this seam. It is the "lower Waterloo" of Orton's Reports. Openings are made South, East, North and West of Waterloo, several miles in each direction.

It ranges in thickness from 4 to 6 feet. Is a solid, bright coal, and will bear transportation well. The analysis shows it a remarkably pure coal. It is unquestionably the most valuable coal in the County. Its horizon may be found on either side of the road from near Hecla Furnace to Sprinkles Mills in Gallia County—say a distance of 25 miles.

**Coal Number 7** of the Survey, (or as now classified by Prof. Orton) is nowhere opened along line of the proposed road.

Its horizon is 35 to 40 feet above 6b, and the blossom is almost constant

where sections have been taken, but indications are that it is not to be found here of sufficient thickness to have any commercial value. Though in more Northern portions of the coal field it is a workable seam.

**Coal Number 7a.** This seam, owing to absence of No. 7 has throughout this district been called No. 7. In Guernsey County where it is 4 to 5 feet thick, it is known as the "Cambridge" Coal, and is highly prized in the Cleveland and other markets where it is so d. In the Nelsonville region it is a valuable vein of coking coal.

Its horizon puts out a good appearance, and all the indications are that it will develop a good seam. The only place it is known to be mined near line of road, it is 4 feet thick. This seam will be found above and on either side of the road from Hecla Furnace to the Mouth of Sand Fork in Gallia County, distant 27 miles.

The seam lies close under the big sandstone, over which lies Cambridge limestone. It is 35 to 40 feet above No. 7.

**Coal Number 7b** lies immediately under the Cambridge Limestone. Owing to the tendency of the earth to slide about this limestone, there are many fine exposures of the coal. It is usually found about 3 feet thick, though frequently obtaining a thickness of 42" to 44."

Its horizon will be found above the road from near Hecla Furnace to the crossing of Raccoon Creek, distant 30 miles; but much of this distance it would be very high in the hill, and consequently of limited area. But in the vicinity of Arabia it is the popular coal, none other being mined, though two or three of the larger veins are accessible. There are a great many openings in this locality and by reason of the "dip" of strata, the coal is of large area and easily accessible.

The "slate vein" is the next in the series. This is a small vein of coal found in the "barren measures," 35 feet above Cambridge lime. There are many exposures of this seam, but few openings for mining. It is worked for local use East of Arabia. It is a pure coal, and about 30" thick. It being so high in the hills and a thin vein it is not regarded as having any commercial value.

The highest of the coals in our list is found on Greasy Ridge, this County. It is in the Upper coal measures. Is found and mined for local use 150 feet above the Ames Limestone.

The vein is 4 to 5 feet thick; three-fourths of this of most excellent quality. This coal could not be reached from the line of proposed road except by building a branch road 3 miles long up valley of Buck Creek.

### CLAYS.

The Fire and Potters Clays along the line of road are practically inexhaustible. There are four seams ranging from 2 to 7 feet in thickness. The clays are acquiring a reputation for their excellence. The Fire Clay has been pronounced by Fire Brick Manufacturers equal to the best in the world. Large Pottery Works are now in process of construction in this City to use the Potters Clay. In mining the ores and lime in this locality,



many thousand tons of these clays are annually mined and dumped aside, where they will "weather" and doubtless much of it be used in the future

### QUANTITIES.

It is estimated that minerals can be mined within one mile of the line of road as follows:

Limestones. —					TONS.	TONS.
Hanging Rock,	-	-	-	-	110,552,400	
Snow Fork, }						
Norris, }	-	-	*	-	110,552,400	
Shawnee, }						
Cambridge,	-	-	-	-	165,828,600	
Ames,	-	-	*	-	55,276,200	— 442,109,600
Iron Ores. —						
Limestone Ore,	-	-	-	-	16,664,765	
Ore immediately below little Buff Limestone,					25,007,147	
Other ores above and below Buff Limestone,						
but without definite geological names,					25,000,000	— 66,671,912
Coal. —						
No. 5 vein	-	-	-	-	33,165,720	
" 6 "	-	-	-	-	24,874,390	
" 6a "	-	-	-	-	37,311,585	
" 6b "	-	-	-	-	49,748,780	
" 7a "	-	-	-	-	24,874,390	
" 7b "	-	-	-	-	12,437,195	— 182,412,060
						700,192,592

The tons of Fire Clay and Potters Clay, would equal at least one half of all the other minerals. By branch roads, up side ravines, the minerals in 3 times the area here estimated will be accessible.

Respectfully submitted,

E. McMILLIN.

## *DATA REFERRING TO PROPOSED RAIL ROAD.*

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The name of the Company is "The Ironton and North Eastern Rail Road Company."

Capital Stock, \$1,000,000.00.

Termini Ironton, Lawrence County, and Gallipolis, Gallia County, Ohio. Length of road forty five miles.

Bonds to be issued \$20,000 per mile on Road Bed, and \$10,000 per mile on Coal Lands. Bonds to bear interest at the rate of 6 per cent. per annum. Interest payable semi-annually. Principal and interest of Bonds payable at.....BANK NEW YORK CITY.

It is proposed to use a 56 pound Steel Rail.

The connections of the Road will be with Scioto Valley R. R. and Iron Rail Road, now Toledo, Delphos & Burlington at Ironton, with Chesapeake & Ohio, Lexington & Big Sandy and the Catteroi Railroad at Ashland, with Ohio & West Va., now Columbus, Toledo & Hocking Valley and the Ohio Central, Richmond & Alleghany Railroads at Gallipolis and with the Ohio Southern in the Symmes Valley above Waterloo. Will have connection with Cincinnati over the Scioto Valley and Ohio Valley Railroads.

Will be able to furnish coal to the Scioto Valley, the Cincinnati & Portsmouth, the Cincinnati & Eastern, and the Ohio Valley Railroads. These roads and the country they traverse, together with the cities of Ironton, Portsmouth, Ripley, New Richmond and Cincinnati will furnish the market for the coal of this road. The demand will be equal to the capacity of the road.

The Iron Railroad does not in any manner control the Iron Manufacturers of Ironton.

The coal mines from which the Rolling Mills draw their supply are located on the Iron Railroad, but their mines are nearly exhausted and the coal is inferior to the coal along line of I & N. Eastern Railroad. Their supply is obtained from the seam known as No. 5.

The grades of the Iron Railroad are, entering the city, 96 feet to the mile. Going out of the city 121 feet to the mile.

Grades of the Ironton & North Eastern are 30 feet, entering Ironton, and 37.90 feet going out of the city.

A pamphlet accompanying this report entitled "Ironton, its Industries, Resources and Facilities," sets forth in proper shape the business and manufacturing interests of this city and vicinity; though written before the completion of the Scioto Valley Railroad or the construction of the Toledo, Delphos & Burlington Railroad.

It has been stated by the officers of the Scioto Valley Railroad Co., that



the traffic of the road has increased five fold since its extension from Portsmouth to this city and to Ashland.

### ESTIMATE OF PROBABLE BUSINESS.

#### Local Business.—

The Blast Furnaces now in operation in this city	
will use of stone coal and coke per day about	300 tons.
The three mills of coal about.....	300 “
The Furnaces will use of ore about.....	300 “
And limestone about .....	200 “
Total .....	1300

Most of the fuel for manufacturing purposes in this city will come in over this road, if the coal is of such quality as analysis and appearance now indicate it to be.

Half the Ore and Lime would probably enter the city by this route.

The estimate will show then—Tonnage on Coal...	500 tons.
Ore and Lime .....	300 “
Total.....	800

The Iron Railroad extending out from this city 13 miles averaged freighting 575 tons per day for 300 days in 1880, and this did not include any fuel for Blast Furnaces but did include probably 40 tons per day more pig metal than would come over this road from furnaces now constructed.

Should the coal along this route prove to be all that is claimed for it, that is, a good smelting coal, other blast furnaces will doubtless be constructed in the vicinity of this city.

In these estimates no account is taken of the coal used by machine shops, foundries, potteries, gas works, flouring, saw and planing mills, or of the domestic use for a city of 10,000 inhabitants.

It is however proposed to organize a large Coal Co. for shipment of coal to Cincinnati by barges on Ohio river from this city, or by Rail, should the low grade road, now under contemplation down the Ohio Valley be constructed.

The comparatively short distance to Cincinnati and the superior quality of the coal, should enable a Coal Company to market at least 2000 tons of coal per day. The local business of the road constructed only to Waterloo, (23 miles) would be about 3000 tons per day, exclusive of out-going freight.

With a connection made with the Springfield Southern from Jackson, with the Columbus, Toledo & Hocking Valley at Gallipolis or some point North, and connections with the Kanawha Valley roads at Gallipolis, the road should have a yearly business second to few roads of equal length in the country.

Accompanying this, we hand last annual report of the business of the Iron Railroad Co. of this city.

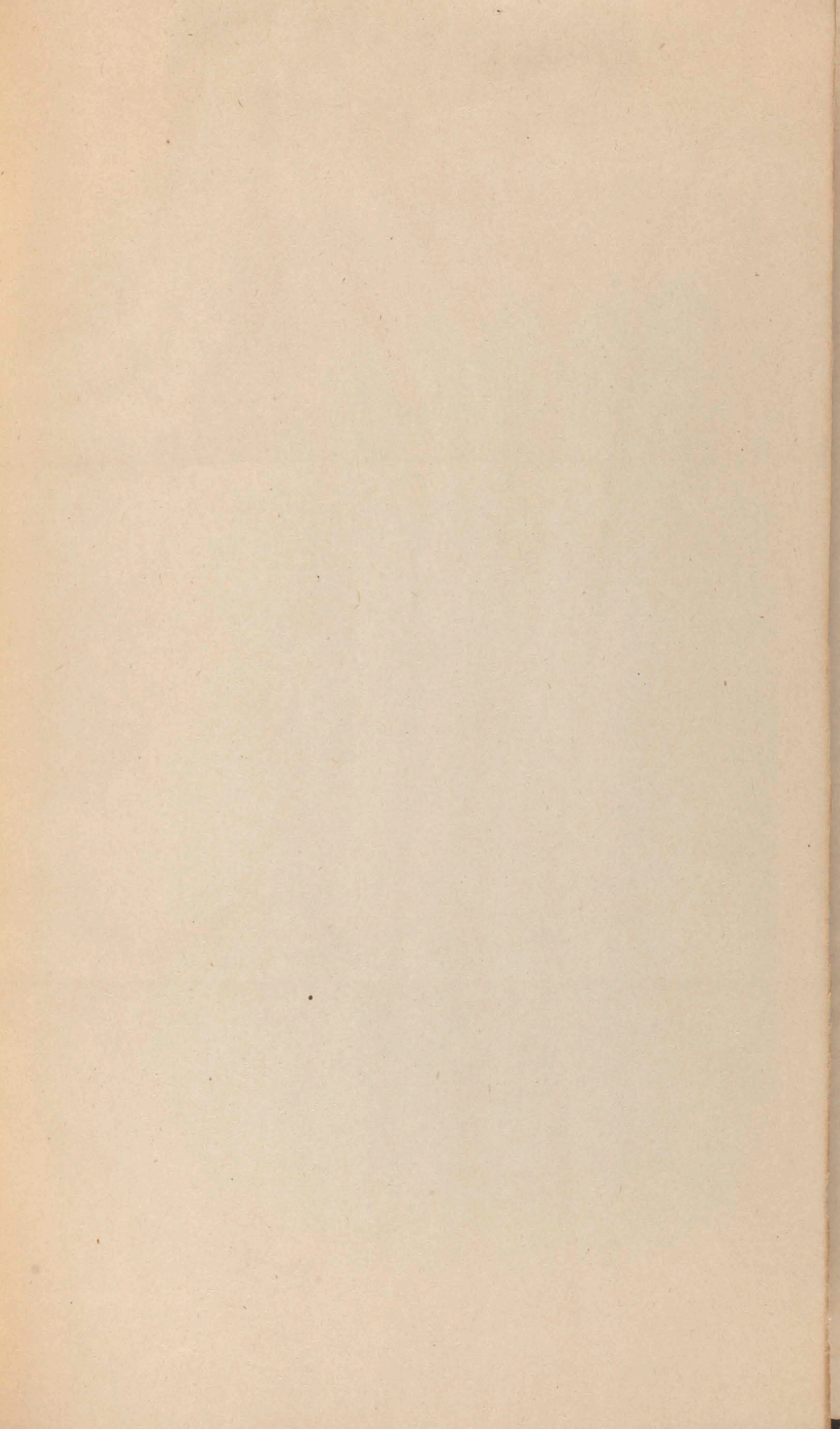












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